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# SCIENCE NEWS LETTER



THE WEEKLY SUMMARY OF CURRENT SCIENCE



Island Universe

See Page 10

A SCIENCE SERVICE PUBLICATION

## Where voices are powered by the sun



Solar battery on pole near Americus, Ga. Battery supplies power directly to line by day and charges storage battery for night use.

A new kind of telephone system developed by Bell Telephone Laboratories for rural areas is being operated experimentally by electric current derived from sunlight. Electric current is generated as sunlight falls on the Bell Solar Battery, which a lineman is seen adjusting.

The exciting achievement is made possible by two Laboratories inventions—the solar battery and the transistor. The new system uses transistors to the complete exclusion of electron tubes. Transistors require little power and this power can be easily supplied by the solar battery.

Compact and economical, the system can carry several voices simultaneously without interference. It has proved its ruggedness by standing up to heat, cold, rain and lightning.

It promises more and improved telephone service for rural areas and it typifies the Laboratories' continuing efforts to make American telephony ever better.



In sending and receiving terminals, transistors are used as oscillators, amplifiers and regulators, and for signaling.



One of the transistors (actual size) used in the new system. The project called for new ideas, equipment, tools and methods.

**BELL TELEPHONE LABORATORIES**



*Improving America's telephone service provides careers for creative men in scientific and technical fields.*

## GEOPHYSICS

# To Study Whistlers

In connection with International Geophysical Year, network of observing stations will observe these radio waves of audio frequency, born of lightning flashes.

► WHISTLERS will receive special attention during the International Geophysical Year, 1957-58, when 40 nations join in attacking the earth's mysteries.

These whistlers are radio waves of audio frequency that are born of individual lightning impulses. Dr. Millett G. Morgan of Dartmouth College told the American Association for the Advancement of Science meeting in Atlanta how a network of observing stations will observe them as convenient natural probes of space just outside the earth's atmosphere. Whistlers are not the same as cosmic noise due to radio waves from outer space.

The radio commotion of the lightning is spread into various low frequencies which travel between the two hemispheres along the lines of the magnetic field. These paths rise in the middle latitudes of the earth to heights as great as the earth's diameter.

Already through their use there are hints that the amount of matter in the extreme outer atmosphere is a hundred times as great as previously thought.

The scientists will also listen in on what they call the dawn chorus, a radio effect connected with the aurora and magnetic disturbances and caused by the bombardment of the earth by material shot from the sun. They hope to settle what comes from the sun to disturb radio, TV, and wire communication here on earth, particularly at the time of the greatest prevalence of sunspots.

Extremely accurate aiming of the earth satellites or artificial moons will be necessary when they are launched from rockets 200 to 300 miles above the earth. Dr. Homer E. Newell, Jr., of the Naval Research Laboratory, Washington, explained that if the angle of shooting of the little object from the top point of rocket flight varies more than a degree and a half from the horizontal it will be plunged into the denser atmosphere and burn itself out.

The first earth satellites may not be able to send messages back to earth by radio because of the weight of the apparatus within them needed to do this. Even an uncommunicative or uninstrumented artificial moon can give scientists much information, just as measurements upon the moon have helped understand the shape of the earth. The earth may get a new determination of its waistline or the actual amount of bulging at the equator. The man-made moon will give higher accuracy than hitherto possible to some of these fundamental measurements.

High-speed computers or electronic brains will be used to plot the paths of the satel-

lites in the sky. The inaccuracies of our knowledge of the shape of the earth will cause some of the first man-moon flights to be lost to view, but as more are launched and followed the predictions of the orbits will improve as the new information of the earth's shape is acquired.

Antarctica will be one of the most observed regions of the earth two years hence. Ten other nations will join the United States in setting up over 40 stations on or around the south polar continent.

The South Pole itself will be occupied for a continuous period with scientists delivered there by parachute from airplanes. Our expedition now in Antarctica is a preliminary bout with the earth's most empty quarter, a continental ice-covered area 6,000,000 square miles in extent. An antarctic veteran, President Laurence M. Gould of Carleton College, Northfield, Minn., predicted to the scientists in Atlanta that important new knowledge will result from this concerted attack on the last known earth areas.

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## VETERINARY MEDICINE

## Dogs Fare Better When They Regulate Own Food

► MOST DOGS stay in good flesh and condition, make better use of their food, and have better manners when they are allowed to feed themselves as often and as much as they like, Dr. J. W. Bernotavitz, director of the Gaines Research Kennels, New York, reported.

During a five-year experiment on the results of self-feeding on kennel dogs, using unlimited amounts of homogenized dry meal, Dr. Bernotavitz found only a few out of several hundred dogs that did not learn to regulate the amount of food they ate to their needs.

He noted that when a dog is put on a dry self-feeding program, he will gorge himself with food for about a week or two. The dog soon learns, however, there is no competition and the food is always there when he wants it. He then adjusts his food intake to his caloric requirements, the scientist said.

Results of tests indicate dogs make better use of the food they eat by taking it frequently in small portions rather than in one or two large portions a day, Dr. Bernotavitz said. In this way, the level of nutrient materials in the blood stream is held more nearly constant and over a much greater period of time.

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**MATCH-SCRATCHER**—This unusual fish was recently received by Fort Worth's James R. Record Aquarium. It is variously known as "unicorn fish" because of its retractable spine; as "helicopter fish" because of its underwater hovering, up and down, forward, backward or sideways motion; and as "file fish" because of its rough skin. Its skin is frequently tacked up in a ship's galley for striking matches.

## ASTROPHYSICS

## To Send Small Rocket Up About 60 Miles

► EXPLORATION of the upper atmosphere and the fringe of outer space is being planned at Woomera rocket range as part of the joint British and Australian geophysical year program in 1957-58.

It will be different from the United States space satellite program, it was reported in Sydney, Australia, by H. J. Brown, controller of the Weapons Research Organization.

"We are thinking of getting a small rocket to a height of 300,000 feet, or about 60 miles, in a much less expensive way than the big three-stage rockets," he said.

A small instrument-crammed rocket powered by solid instead of liquid fuel may be sent to about 70,000 feet, attached to a large balloon and then fired by radio. It should reach a height of 300,000 feet, Mr. Brown explained.

This rather inexpensive way of getting recording instruments into the last layers of the atmosphere has been discussed by other countries but has not yet been tried.

The chairman of the Royal Society's Upper Atmosphere Committee, Prof. H. S. Massey who was in Australia to discuss the plan, said recently that the high-altitude rockets from Woomera could help solve the problems of space travel.

He stated that rockets, probing 120 miles into the upper atmosphere, could be launched from Woomera in two years.

Prof. Massey spent two months in Australia discussing Australia's part in space travel experiments with the Upper Atmosphere Research Committee of the Australian Academy of Science.

He said that Britain and Australia have a combined program to investigate the upper atmosphere with rockets.

"We want to insure there will be no overlapping."

America had a nine-year lead over Britain on space-rocket experiments. But Britain planned to send up its first space rockets in two years, which showed how Britain was advancing with space experiments, he pointed out.

Prof. Massey said that ground work had

begun in Australia on rockets to investigate space. He did not know how far the work had gone.

Biggest problem in future space travel, he indicated, would be space medicine. Space medicine could make it possible for humans to get into space despite tremendous acceleration.

Navigation in space travel would have to be extremely accurate and was another major problem, he said.

Practical work for the rocket research program is being conducted in a top secret atmosphere at the Long Range Weapons Establishment at Woomera, South Australia.

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#### MEDICINE

## Ammoniated Cigarettes

**Next thing that may be tried by smokers who want to go on smoking without fear of lung cancer. Ammonia fumes reduce the tar in cigarette paper.**

► AMMONIATED cigarettes may be the next thing tried by smokers who want to go on smoking without fear of getting lung cancer.

This is suggested by reports from S. Z. Cardon and E. T. Alvord, research chemists with the Rand Development Corporation, Cleveland, to the American Association for the Advancement of Science meeting in Atlanta.

Treating cigarette paper with chemicals which give off ammonia when heated reduces the benzpyrene found in the tar from the paper, they reported. Benzpyrene causes cancer in laboratory animals. The ammonia treatment also reduced the amount of the chemical in the tar of the whole cigarette.

Whether this chemical exists in large enough amounts in cigarette paper to be responsible for the statistical association between cigarette smoking and lung cancer is a question scientists have not yet agreed on.

Discovery of the chemical in cigarette paper tar was announced by Mr. Cardon, Mr. Alvord and Donald V. Lefemine of the Cancer Institute, Miami, Fla., a year ago, (SNL Oct. 30, 1954).

Now Mr. Cardon and Mr. Alvord report repeating the original experiments in a way to determine the amount of benzpyrene in cigarette paper as it is burned when wrapped around a cigarette and the whole thing "smoked" in a machine designed by the research laboratory of the American Tobacco Company.

They found an average quantity of 2.5 micrograms of benzpyrene per package of cigarettes. No significant difference was found among several popular brands.

Seeking a way to check the formation of benzpyrene in burning cigarettes and their paper, the scientists tested several hun-

dred compounds. Best seems to be ammonium sulfamate.

Cigarette paper treated with as little as five percent of this ammonia compound by weight reduced the amount of benzpyrene in the tar from the burning cigarette paper by 95%. A 60% reduction in benzpyrene was obtained in tar from cigarettes made with this treated paper. Apparently the ammonia reduced benzpyrene formation from the tobacco as well as from the paper.

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#### MEDICINE

## See Aspirin Effect Due To Dual Action on Glands

► THE RELIEF ASPIRIN gives to arthritis patients seems to come from a dual effect of the drug on two glands of the human body.

Studies suggesting this were reported by Dr. Alan K. Done of Salt Lake City, Utah, to the American Rheumatism Association meeting held at the National Institutes of Health, Bethesda, Md.

The two glands are the pituitary gland in the head and the adrenal glands, producers of anti-arthritis cortisone. The pituitary influences these glands through one of its hormones, ACTH.

Aspirin, Dr. Done reported, stimulates the pituitary and, as a result, there is an increase in production of adrenal gland hormones known collectively as steroids.

Second effect of aspirin is to increase the rate at which these steroids are removed from the circulating blood by means other than excretion through the kidneys. This implies that aspirin also influences hydrocortisone after its release from the adrenal glands.

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## RADIO

Saturday, Jan. 14, 1956, 2:05-2:15 p.m. EST  
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Francis O'Neill, director of the Central Islip State Mental Hospital, on Long Island, N. Y., will discuss "Drugs Against Mental Illness."

The availability of many kinds of human cancer growing routinely outside the human body is widely regarded as a development that may accelerate cancer research throughout the world.

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## MEDICINE

# Teach Hens To "Smoke"

**Four Scottish biddies have learned to smoke half a cigarette every other day for several months. Other animals would not learn to smoke.**

► WHILE it is improbable that the habit will be adopted by the poultry population of the world as a whole, hens in Glasgow, Scotland, are learning to smoke cigarettes. Four hens have smoked half a cigarette every other day for several months in the Cancer Research Department of the Royal Beatson Memorial Hospital, Glasgow.

They did not seem to mind once they had become used to it, reports P. R. Peacock, who has been in charge of this new approach to the problem: Does cigarette smoking cause lung cancer?

It was realized that conclusive proof could only be gained by a controlled experiment, which could not be performed on humans. Unfortunately, it is difficult to teach animals to smoke.

Mice were tried, unsuccessfully, even as non-smokers. If they were kept in a smoke-filled box, they seemed to find the experience "disagreeable," and they were classified as uncooperative.

Moreover, the box did not provide a parallel to the human habit. The mice

could not get a breath of fresh air at all, whereas human smokers can take several breaths between puffs. In addition, the smoke clung to the mice's fur and they licked it, confusing the test results.

Now the research workers are using hens, by making a small hole in the air sac leading to the lung. This does not injure the bird and it is possible to "smoke" a cigarette into it by means of a syringe.

"Some birds merely showed surprised interest in the smoke emerging from their beaks," says Mr. Peacock.

Others closed their eyes and dropped their heads, evidently disliking the experience. When this occurred the smoking was immediately stopped for the day.

Birds quickly became accustomed to the procedure and after a few days showed no signs of discomfort and accepted their smoke without opposition.

The question remaining, which must be answered in a further report is: Will any of the cigarette-smoking fowl develop lung cancer?

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## MEDICINE

# Treatment of "Dead Drunk"

**Injection of salt solution into veins or treatment with artificial kidney suggested to flush alcohol out of system as rapidly as possible.**

► SALT solution injected into the veins in large amounts was advised for treatment of "dead drunks" in a report by Dr. Theodore Koppanyi of Georgetown University, Washington, D. C., to the American Association for the Advancement of Science meeting in Atlanta.

Treatment by the artificial kidney for six to eight hours might also prove useful, Dr. Koppanyi said.

Object of either treatment would be to flush the alcohol out of the system as rapidly as possible.

Injecting salt into the veins would greatly dilute the alcohol in the blood and therefore lessen the poisonous action on the brain and nervous system. It would also greatly speed the excretion of the alcohol by the kidneys because the added fluid would be excreted.

This method, in which the fluid injected contained one percent of salt (sodium chloride), saved the lives of animals getting enough alcohol by mouth to kill 99 out of 100 of them, Dr. Koppanyi and asso-

ciates found.

Whether the salt solution treatment or the artificial kidney is used, care must be taken to avoid embarrassment of the heart, or waterlogging the lungs and brain, Dr. Koppanyi warned.

While the new tranquilizing drugs as well as older sedative ones are good for the inebriated, the "dead drunk" is in more serious condition and requires different treatment, Dr. Koppanyi said. It is for these "poor medical risks" that he advises the salt or artificial kidney.

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## DENDROLOGY

# Atomic Radiation May Bring Back the Chestnut

► ATOMIC RADIATION may be the means of bringing back the once-magnificent stands of American chestnut trees, now almost absent from our forests, Dr. W. Ralph Singleton, University of Virginia

geneticist, told the American Association for the Advancement of Science meeting in Atlanta.

Near the turn of the century, the chestnut blight fungus, *Endothia parasitica*, appeared in New York state and spread rapidly with devastating results. By the 1930's, nearly all commercial chestnut stands in the East had succumbed to the disease.

There are no large trees now growing, said Dr. Singleton, although in several localities young chestnuts flourish long enough to bear a few nuts before being killed by the fungus. "Since it is possible to obtain seeds on these young trees . . . we believe it will be possible to produce resistant types by radiation, and establish a resistant type that could be used in reforestation of wide areas that were once the home of the chestnut," he predicted.

"It has been amply demonstrated working with other crops that radiation can produce disease resistance. The principles are the same for chestnut breeding as for smaller crops."

A start has already been made on this project at the University of Virginia's Blandy Experimental Farm. Seeds collected from a small chestnut grove in Virginia have been planted at the farm, and pollen will be treated with radiation and applied to chestnut flowers in the old grove, Dr. Singleton reported.

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## AGRICULTURE

# Rust-Resistant Wheat Brings Medal Award

► TAKING A PLACE beside discoverers of penicillin and radium and the inventors of the airplane and the radio, Edgar S. McFadden, agronomist of Texas A & M College, has been awarded the John Scott Medal for his origination and development of the first rust-resistant bread wheat.

According to the American Association for the Advancement of Science, an estimated 25,000,000 people are eating today who otherwise would be dead or dying of starvation, thanks to Mr. McFadden's discovery.

Mr. McFadden's rust-resistant wheat was presented in 1915, when both stem and leaf rust had become a serious threat to the nation's wheat supply. Land that could have produced 40 bushels to the acre commonly gave only five bushels, due to rust attack.

The John Scott Medal, which has been awarded to Orville Wright, Thomas Edison, Madame Curie, Dr. Vannevar Bush, Guglielmo Marconi, Sir Alexander Fleming, and Vincent du Vigneaud was presented to Mr. McFadden at the American Association for the Advancement of Science meeting in Atlanta.

The medal is named for John Scott, a chemist of Edinburgh, Scotland, whose will in 1816 established the award, to be administered by the City of Philadelphia.

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## MEDICINE

# Drug Stops Trembles

**New drug stops parkinsonism while patient goes on taking tranquilizing drug for mental condition. Tremors are due to stimulating effect of tranquilizers on reticular formation.**

► A DRUG that stops the finger trembling caused by some tranquilizing drugs has been found. The drug and the reason why it is effective were reported by Drs. Harold E. Himwich and Franco Rinaldi of the Galesburg (Ill.) State Research Hospital, to the American Association for the Advancement of Science in Atlanta.

The drug is benztropine methanesulfonate, trade named Cogentin. It combines the effects of atropine and the antihistamine, diphenhydramine, or Benadryl.

The finger trembling it controls is one of the abnormalities seen in parkinsonism, or shaking palsy as it is popularly known. When it hit patients getting chlorpromazine or reserpine for mental sickness, the doctor had to stop these drugs or at least reduce the dose, but this made them less effective in controlling the mental illness.

Now, according to the Galesburg researchers' findings, the new drug can be given to counteract the parkinsonism, or trembling, while the patient goes on taking the tranquilizing drug to relieve his mental symptoms.

The trembling, or tremors, are due, rabbit studies suggest, to a stimulating effect of chlorpromazine and reserpine on the reticular formation. This is a structure which extends throughout the central core of the brain and exerts control over the motor activity of the body. Atropine and similar

drugs depress the activity of the reticular formation and that may be the reason why they improve abnormal muscular function of patients with parkinsonism. The Galesburg researches show that the new atropine-like drug, Cogentin, is particularly effective in depressing the abnormal activity of the reticular formation. That may be the reason why it helps patients with parkinsonism.

These drugs not only improve the physical disability of the patients but also their subjective feelings so that the patients feel much better whether or not their motor disabilities are entirely cured.

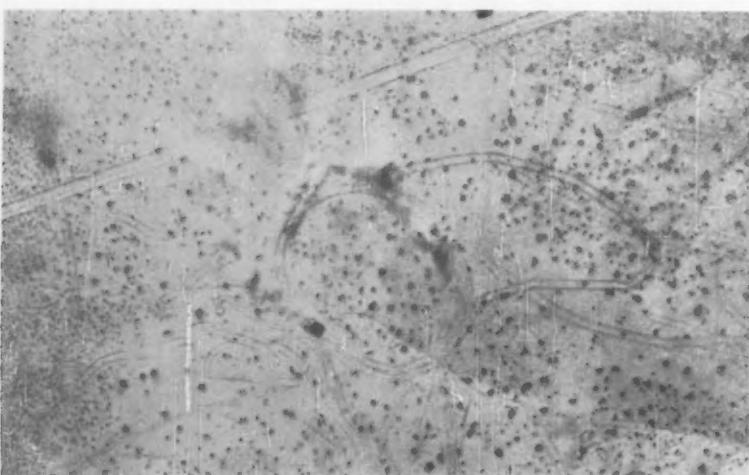
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## PSYCHOLOGY

## Monkeys Can Learn When One Week Old

► A BABY MONKEY less than one week old is capable of the simple kind of learning that a psychologist calls conditioning, Dr. Harry F. Harlow of the University of Wisconsin told the American Association for the Advancement of Science meeting in Atlanta. At the age of 20 days they show a strong urge to monkey with things.

Dr. Harlow has put a total of 26 baby macaque monkeys through an extensive program of psychological testing and learning during the first months of their lives.



**"ENEMY TRACKS"**—This aerial photo taken by the radio-controlled drone plane shown on facing page emphasizes any tracks or marks on the earth. Front-line units operating their own drones can gather battlefield intelligence in a matter of minutes.

Beginning between 20 and 30 days of age, the monkeys displayed a strong urge to explore and manipulate the world around them and this urge was found to be apparently independent of such biological needs as hunger or thirst.

A monkey is an excellent subject for psychological research, Dr. Harlow told his colleagues. Although it can be trained so early in life, it does not become mature and "graduate" too soon. The monkey does not reach full intellectual maturity until it is two or more years old.

Most of the monkeys used in Dr. Harlow's experiments were separated from their mothers at birth and raised under completely controlled experimental conditions.

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## MEDICINE

## Gland Extract Tried to Stop Alcohol Craving

► TREATMENT with a gland extract or hormone might be the way to curb or even abolish an alcoholic's craving for drink.

The treatment works in rats. A very few observations made in a beginning trial on human alcoholics suggests that it might work for them, too.

Thyroid extract and thyroxine are the gland chemicals that do the trick in rats, Dr. Curt P. Richter of Johns Hopkins Hospital, Baltimore, reported at the meeting of the American Association for the Advancement of Science in Atlanta.

Dr. Richter gave his rats thyroid extract because he was trying to induce a craving for alcohol in them. That would have given him laboratory animals for study of alcoholism.

Thyroid extract greatly increases the rats' appetite for sugar, he had found. But it has just the opposite effect on their appetite for alcoholic beverages. Given a choice of water, alcohol, wine or whiskey, the rats preferred water. They either greatly reduced their intake of the alcoholic beverages or stopped drinking them altogether. Refusal of beer was not so striking. That may be because it has some carbohydrate in it which the thyroid extract would make the rats like as they like sugar.

Hyperthyroid patients, that is patients whose own thyroid glands are producing excessive amounts of hormone, very rarely are alcoholic, Dr. Richter pointed out. So he thinks a small daily dose might stop the alcoholic's craving for drink.

Trial of this new treatment is starting under the direction of another scientist. So far, too few patients have been observed for any report.

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If a 200-pound man stands on his right foot, he imposes a weight of 500 pounds on his right hip.

The American baby will live, on the average, 21.5 years longer than his grandparents who were born in 1900.



**DRONE PHOTOGRAPHER**—This radio-controlled drone plane assisted by JATO rocket races down a launcher. With this drone plane carrying a modern camera, front-line units can secure their own battlefield intelligence.

See facing page.

#### MEDICINE

## New Drug Is Calming

**Meprobamate found to have good results with alcoholics and mental patients and is without undesirable side effects except for low blood pressure with large doses.**

► A NEW tranquilizing drug called meprobamate is calming belligerent mental patients, helping alcoholics through the sobering-up process and relieving tension headaches, muscle spasm and other nervous states in less severely ill patients.

Reports on its good results with alcoholics and mental patients were given at the meeting of the American Association for the Advancement of Science in Atlanta.

Of 301 disturbed mental patients, 33 have been returned to their homes as a result of treatment with this drug, Dr. Veronica M. Pennington of Mississippi State Hospital at Whitfield, Miss., reported. Another 29% have been greatly improved, 50% show some improvement and in 18% very little change is evident.

She found this new drug safe with almost complete lack of side effects, except for low blood pressure when large doses were given.

Patients must go on taking the drug in order to continue mentally healthy, just as diabetics usually must continue to take insulin to remain well. Of five patients who had gone home but had to return to the hospital, only one had continued to take the drug while at home as instructed.

A quality of this drug not previously reported is its ability to remove the odor of perspiration. Dr. Pennington reported that

four patients who for years had a "skunk-like odor" which no amount of bathing changed no longer have this disagreeable odor.

More than 74% of alcoholics benefited from the drug during the withdrawal period. Anxiety symptoms were relieved and the shakes lessened, Dr. Joseph Thimann of the Washingtonian Hospital, Boston, reported.

The drug is made by Wallace Laboratories, Inc., New Brunswick, N. J., who call it Miltown.

Unlike other tranquilizers, this drug in normal doses selectively depresses the deeper parts of the brain, calming without dulling the senses, according to animal studies reported by Dr. C. D. Hendley of Wallace Laboratories.

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#### GEOPHYSICS

## Name Scientists To Direct IGY

► APPOINTMENT of three top scientists who will direct U. S. participation in programs of the International Geophysical Year, or IGY, was announced in Washington.

Dr. Edward O. Hulbert, retiring director of research at the Naval Research Labora-

tory in Washington, has been named senior scientist of the U. S. National Committee for IGY.

The Weather Bureau's director of meteorological research, Dr. Harry Wexler, was appointed chief scientist for the Antarctic program. Albert P. Crary will serve as Dr. Wexler's assistant, and also as chief scientist for glaciology studies in the Antarctica area.

The International Geophysical Year is a world-wide study of the earth, its seas and atmosphere scheduled to begin July 1, 1957. Scientists from more than 42 nations will cooperate in the most comprehensive and intensive study of this planet ever undertaken.

Particular emphasis will be placed on obtaining information from those areas where there have been few previous scientific studies.

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#### VETERINARY MEDICINE

## Enzyme Chemical Helps Animal Wounds to Heal

► WOUNDS and inflammations in dogs, cats, cattle and horses are helped to heal quickly and completely by an enzyme chemical called pancreatic dornase, the American Veterinary Medical Association, Chicago, reports.

Another enzyme has been found useful in treating gangrenous mastitis in dairy cows, the association reports.

The enzymes are sometimes used alone and sometimes as an auxiliary to antibiotic treatment.

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#### MINERALOGY

## "Deep Down" Minerals Created in Laboratory

► RARE MINERALS seldom found near the earth's surface have been created at the University of California at Los Angeles by subjecting common minerals to extreme pressures and temperatures.

Using a laboratory device called the "simple squeezer," Drs. George Kennedy and David Griggs and co-workers in U.C.L.A.'s Institute of Geophysics have duplicated conditions that form minerals at extreme depths in the earth's crust.

From common quartz they have created coesite, a dense mineral that can exist in nature only at a depth of 40 miles or more in the earth. They have made jade from feldspar and aragonite from limestone.

The U.C.L.A. scientists have also been able to make various dense aluminous minerals from ordinary clay. From data on temperatures and pressures required to make these minerals, the depths at which similar minerals are formed in the earth's crust can be determined.

Much of the work has been done at temperatures as high as 1,800 degrees Fahrenheit and at pressures up to 1,200,000 pounds per square inch.

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## MEDICINE

## Soft-Shelled Ticks Rabbit Fever Carrier

► BEWARE of soft-shelled ticks. They can be carriers of a serious disease that most often strikes at hunters, rabbit fever, or tularemia.

Though it has been known for several years that several species of hard-shell (ixodid) ticks can transmit tularemia, the soft-shell (argasid) types had not been considered as carriers of the disease. Now, however, experiments at the Rocky Mountain Laboratory of the U. S. Public Health Service, Hamilton, Mont., have finally put blame on the soft-shelled ticks, too.

Dr. Willy Burgdorfer of the laboratory told the American Association for the Advancement of Science meeting in Atlanta that four species of soft-shelled ticks tested proved capable of transmitting the disease from sick to healthy animals. These ticks are commonly found on numerous animals, especially rodents, known to be naturally infected with tularemia germs.

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## GENERAL SCIENCE

## Science Study on Upgrade in Baltimore

► IN BALTIMORE, at least, boys and girls in the senior high schools are studying science in constantly increasing numbers, Dr. Lorne H. Woollatt, research director of the Baltimore Public Schools, told the American Association for the Advancement of Science in Atlanta.

Enrollment in science is almost as large as it ever was, biology students are at a peak for 22 years, the number taking chemistry has been increasing since 1951, and physics enrollment has been increasing since 1949 but has not reached the 1934-44 levels.

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## EDUCATION

## Mental Test Found To Penalize Negroes

► THE RAVEN TEST, used to some extent in the public schools to measure general intelligence, may put a penalty on Negro children if its use becomes widespread, Dr. Conwell Higgins of the Board of Education, Albany, N.Y., warned at the AAAS meeting.

The Raven test measures the ability to select from six pieces the one that will complete a particular pattern. It has been assumed that scores on this visual test are completely independent of previous schooling and cultural differences. It has therefore been thought to be an almost pure measure of general intelligence useful for testing children from different environments.

The Raven test cannot safely be used as a measure of intelligence, Dr. Higgins

found when he gave the test to a group of 129 white and Negro eight-year-old children.

The Negro children scored on the Raven test an average of 13 mental age months below their mental age as determined by the famous Stanford-Binet measure. On the other hand, white children scored slightly higher on the Raven than on the Stanford-Binet.

The Raven test was developed and used extensively in England. It has been introduced here, but so far is not very widely used in the United States.

Science News Letter, January 7, 1956

## AGRICULTURE

## Carbon Acids Effective Against Worm Plague

► NEMATODE eggs, carrying a threat against next year's potato crop, can be killed by spraying the burlap bags to which they cling with fatty acids composed of 11 carbon atoms.

This discovery was reported by Drs. A. C. Tarjan and P. C. Cheo of the University of Rhode Island to the American Phytopathological Society meeting with the American Association for the Advancement of Science in Atlanta.

Solution in water of two percent undecylenic acid, named for the Latin word for "eleven," or of pelargonic acid, another 11-carbon compound was found by these researchers to be 8 to 10 times more deadly to nematodes than the standard nematode killing chemical now in common use. The new compounds are said to be easy to apply, relatively safe for the user, and without obnoxious odor.

Science News Letter, January 7, 1956

## FORESTRY

## West Coast Spruces Hurt by Insect Pest

► A SMALL INSECT, the Sitka spruce weevil, is threatening young stands of Sitka spruce timber growing along the coasts of Washington and Oregon.

K. H. Wright of the Pacific Northwest Forest and Range Experiment Station and Donald Baisinger, research forester of the Crown-Zellerbach Corporation, Portland, reported the insect threat to the 55th annual meeting of the Society of American Foresters in Portland, Ore.

In 1949, studies were made in 20-year-old spruce stands in Clatsop County, Ore., and results showed that the height growth of the trees was reduced by weevil damage. The scientists said nearly 100% of the spruce trees were attacked in some stands.

The scientists said the reduced height resulting from weevil damage permits other tree species like hemlock to grow above the Sitka spruce and eventually choke it out. In the sites studied, hemlock will in time take over the sites where the spruce has been damaged by weevils.

Science News Letter, January 7, 1956

## PSYCHOLOGY

## Urge Teaching Science To Feeble-Minded

► TEACH science to feeble-minded children, urged Dr. Helen B. Ross of State Teachers College, Fitchburg, Mass., speaking before the American Association for the Advancement of Science in Atlanta.

To be sure, these children cannot be expected to grow up to be scientists, but all of us, bright and slow, need to learn to live in a world of science, she explained. As the retarded child gains simple understandings, he is better fitted for the grown-up world.

All children are interested in living things, she pointed out. Care of pets can be used to teach the children respect for life and to help them develop responsibility.

Knowledge of the care of animals and plants may help the child to future job success and can also help him develop useful and interesting hobbies; it can aid him in forming good health habits.

What the feeble-minded child learns about water, gas, electricity and fire can make the world a more interesting place for the child and a safer place for everyone.

Science News Letter, January 7, 1956

## ENGINEERING

## High-Speed Machines Raise Explosion Dangers

► DANGER of sudden gas explosions in coal mines has increased with the growing use of high-speed machinery in the mines, the U. S. Bureau of Mines warns.

The increased danger comes from frictional heat, generated by the high-speed equipment, that may ignite explosive gases present in the mines.

Seven cases of mine explosions caused by such friction-triggered gas ignitions in the last two years have been under investigation by the Bureau.

Mine explosions set off by frictional heat have been more frequent in Great Britain than elsewhere, the Bureau said. Four years ago, 81 British miners were killed in an explosion occurring when a cutting machine struck pyrites at the bottom of a coal bed.

To cut down explosion hazards, the Bureau recommended: adequate ventilation at the coal face; use of enough air and water at the cuts; frequent checking for gas in the air; avoidance of overheating; avoidance of hard rocks in cutting and drilling and equipment on the machines for removal of gas.

Science News Letter, January 7, 1956

IN SCIENCE

## CE FIELDS

## AGRICULTURE

**Pesticides May Harm Useful Soil Fungi**

► HELPFUL SOIL FUNGI that may give natural antibiotic protection to agricultural plants and trees could be harmed by soil fumigation, use of chemical weed killers and other chemical treatments, research reported by the U. S. Department of Agriculture indicates.

Chemical treatment of trees, plants and soil may need to be modified to avoid destroying beneficial fungi, the USDA said.

Besides possible production of useful antibiotics, many fungi are known to aid trees and shrubs absorb greater quantities of nutrient salts from the soil. One type of fungus penetrates between the cells of the fine root hairs of trees, permitting better food absorption by the cells. Another group of fungi actually penetrates the root hair cells, and the resulting digestion of the fungi by the cells results in direct transfer of additional nutrients to the trees.

Science News Letter, January 7, 1956

## PUBLIC HEALTH

**Prediction Made on Future Cancer Toll**

► BY THE YEAR 1975 cancer will be claiming 750,000 new victims per year, scientists of the National Cancer Institute, Bethesda, Md., predict in the *Journal of the American Medical Association* (Dec. 24).

The prediction is based on a cancer survey said to be the largest ever conducted in any country. The survey covered cancer cases, not just cancer deaths. It was carried out in 10 American cities at intervals of 10 years.

The reported cancer incidence rate was 319 per 100,000 population in 1947, the survey shows. This is 30% higher than the rate in 1937. Some of the rise may be due to improved techniques for diagnosing cancer, more doctors specially trained in cancer diagnosis and improved economic conditions leading more people to adequate and specialized medical care. Some of the rise, however, is believed to be "real," and not just the result of factors leading to better diagnosis and reporting.

"More than 500,000 new cases of cancer are being diagnosed in the United States each year," the scientists report. "This number will increase to more than 750,000 by 1975. Under prevailing conditions, 32 out of every 100 newborn children may be expected to develop cancer at some time during their lives; three by age 45, 14 by age 65, and 23 by age 75."

For a number of sites of cancer origin,

the data suggest that some progress has been made in the management of the cancer problem. Further substantial advances are within reach through fuller utilization of available techniques.

► Half of all forms of cancer originate in organs accessible to direct examination by the physician in his own office; yet exclusive of skin cancer, only 50% of cancer developing in accessible sites is being diagnosed while it is localized at the site of origin."

The survey figures are reported by Dr. John R. Heller, Sidney J. Cutler and William M. Haenszel.

Science News Letter, January 7, 1956

## GEOLOGY

**Water Under Permafrost May Cause Odd Behavior**

► THE GROUND'S ODD BEHAVIOR in permafrost areas may be caused in part from water underneath the layer of frozen earth and ice.

This was reported to the Arctic Institute of North America in Montreal by Fritz Muller, a Swiss geologist who spent the summer of 1955 in East Greenland and the Mackenzie River Delta in northern Canada.

Seeking basic data on phenomena such as the heaving of pavement in the spring when frost comes out of the ground, Mr. Muller formulated the theory the heaving was due to water beneath the permafrost. The water, he believes, pushes up to the surface where it freezes into ice hills that look like small volcanoes.

Where the water under the permafrost originates is still a mystery, Mr. Muller pointed out. It may possibly be formed in the earth's center, he said.

Science News Letter, January 7, 1956

## NUTRITION

**City Dwellers Use New Fish Products**

► COUNTRY FOLKS have not taken to new fish products like their city cousins, a U. S. Fish and Wildlife survey revealed.

The survey showed that breaded shrimp consumption is greater by about two to one in urban areas than in country districts. About 40% of the city housewives reported using fish sticks, while only 13% of the rural women questioned said they used fish sticks.

According to the FWS, the greatest problem in marketing new fish products is getting housewives to try them out. Ninety percent of those who had used breaded shrimp reported satisfaction, while about 85% of those who used fish sticks one time became regular buyers.

How do housewives learn to cook fish? The survey showed that cookbooks supply the know-how to 28%, and 12% get their information from newspaper and magazine articles. Another 11% follow the directions on the label.

Science News Letter, January 7, 1956

## GEOPHYSICS

**Appalachians Rose From Sea**

► SOME 200,000,000 YEARS ago when a mass of bent and broken rock, the Appalachian Mountains, rose from the ocean floor, those titanic buckling forces affected only the "shallow" sedimentary rock near the ground surface. The deeper parts of the earth, with its once-molten igneous rock, were relatively unaffected.

This is the conclusion of H. W. Straley III, a geologist with Georgia Institute of Technology in Atlanta, following measurements of magnetism of the Appalachian rocks at several points.

If the deep-lying igneous rock had been bent and broken in the mountain uplifting, it should appear near the surface at different spots. Since it is more magnetic than sedimentary rock, measurements should reveal greater magnetism in these spots if igneous rock had been uplifted, Mr. Straley explained to the AAAS.

Using an instrument that measures the finest differences in magnetism, Mr. Straley found little significant magnetic variation in Appalachian rock, leading him to conclude that deep-lying rocks were not involved in the Appalachian mountain-building.

Science News Letter, January 7, 1956

## GEOPHYSICS

**Volcanic Desert Now Becoming Green**

► A LARGE REGION of Mexico, possibly barren for 390 years, has been regaining green life.

The once lifeless expanse of volcanic ash and cinders in Pinacate, Sonora, near the Arizona border, has acquired a surface cover of green grass and soil as deep as two inches in some places.

This rebirth has been going on since 1931, Dr. Ronald L. Ives, geophysicist with the Cornell Aeronautical Laboratory, reports in *Science* (Dec. 23).

Some possible causes for the rebirth of this lava desert, that may have had no vegetation since 1541 or longer, are known, Mr. Ives states. There has been a slight increase in the annual rainfall and in winter rainfall, and there has been a virtual extinction of the mountain sheep and wild burros.

But even with the increase in rainfall, Mr. Ives does not believe the true cause of the vegetative change is known.

"It is possible," he points out, "that some of this climatic change is 'carry-over' from cloud-seeding operations in the mountains east of San Diego."

So dramatic is the change from lifeless land to the rebirth that when seen from a distance on the ground or from an airplane, Mr. Ives reports, in place of the dark grays, dull reds and blacks of former decades, there is now "a distinctly green tinge."

Science News Letter, January 7, 1956

## GENERAL SCIENCE

# Science Forecast for 1956

**Boundaries of universe will be pushed outward by new device added to giant telescopes. H-bombs will be tested. Radiation controversy will continue. Tornado forecasts expected.**

By WATSON DAVIS

## See Front Cover

► DURING 1956 there will be continued attempts to solve some of the major problems in the application of science to the world.

One of these is the effect of atomic radiation upon the human present and future, which will be considered by a United Nations commission. It will, however, continue to engender controversy.

The atomic competition between Soviet and Western groups was clarified but also sharpened by the successful meeting of atomic scientists of the world at Geneva last August to discuss peaceful atoms.

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The possibility of atomic power from the fusion of light (hydrogen) elements has been conjectured for several years, but at the Geneva conference major atomic powers admitted research programs are under way. Nevertheless it is too much to expect results in the coming year.

The number of fission (uranium) power plants building will continue to grow, with the possibility that the British 60,000 kilowatt reactor will begin operation about mid-year. In the United States seven major atomic power plants should be under design or construction at the end of 1956, but none will be completed by then. Do not be surprised if the Soviets claim atomic submarines to match the atomic sub fleet we are building to join the U.S.S. Nautilus.

The testing of atomic weapons will continue, with H-bomb explosions by the United States, Russia and Britain.

In the United States and presumably in Russia there will be almost frantic emphasis on intercontinental ballistic missiles to replace long-range bombers for delivering H-bombs accurately to the other side of the globe. This research is wrapped in secrecy.

### Image Converter

Less concerned with what happens on earth is the development of a means of pushing farther out the known boundaries of the universe. In effect, the application of an electronic device, an image converter, should increase the power of the giant telescopes ten-fold. The great 200-inch telescope on Mt. Palomar, world's largest, now reaches out into space so far that it takes light about six billion years to come to earth.

Does the universe extend ever outward? How much farther? When the image converter goes into service during 1956, more information regarding depths of the universe will be obtained. It will observe stars now beyond reach, and it will also obtain stellar spectra in shorter exposure times than heretofore.

It will make it possible to learn more about island universes like the Andromeda Nebula shown on the front cover of this week's SCIENCE NEWS LETTER.

The image converter may make unnecessary the building of telescopes larger than 200 inches. The famous 100-inch on Mt. Wilson through its aid is expected to be the equivalent of a 1,000-inch telescope. The 200-inch telescope should do the work now of a 2,000-inch telescope.

Thus the limits of human probing of the universe are pushed outward again, considerably more spectacularly than the im-

provements made in the past decade through the use of better photographic plates.

The most recent of big telescopes, a 120-inch instrument of Lick Observatory on Mt. Hamilton, Calif., will begin operation during the year to become the world's second largest telescope.

Always curious about our own solar system, astronomers will use television techniques, such as the image converters, to try to photograph for the first time the so-called canals on Mars. In determining distances in the universe, globular clusters will be used as one yardstick to measure distances.

### Check Against Atomic Clock

The earth's rotation rate and lunar motion will be checked against the super accurate atomic clocks using cesium and ammonia, thus comparing gravitational and atomic time keeping. Atomic clocks have an accuracy of one part in a hundred million or billion.

At the other end of the scale of the universe, within the heart of the atom, there will be continued exploration of subatomic particles. The bevatron, world's largest atom smasher, which produced anti-protons in 1955, will yield needed information about the spins and other properties of the "strange particles," K-particles and hyperons.

In the accelerating application of electronic computers to many problems and tasks, you can expect these devices to take on a new facility to understand instructions in plain English and then work out and set up their own programming, telling them what to do. Instead of weeks of work by mathematicians, the computer will work out its own instructions by itself in minutes. Computing machines will be developed in which the internal mechanisms for doing things like square roots are replaced by programming.

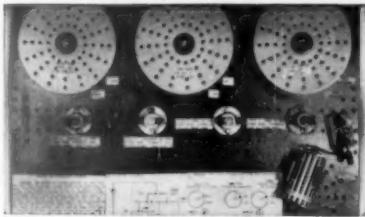
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Machines will be applied to the retrieval of information without the need of elaborate, time-taking classification procedures, and one of the first applications which may begin in 1956 will be to the Patent Office files and to scientific literature.

Expect a concentrated attack on hurricane and tornado forecasting problems by the U. S. Weather Bureau in the coming year. There will also be an expansion of both surface and upper air observations over the seas on merchant ships, ocean buoys, civil aircraft, and offshore commercial and military installations. Techniques will be improved for the reporting and forecasting of flash floods.

The man-made satellite that is due to be launched by rocket in 1957 will undergo promising development and there may even be some preliminary trials of early versions.

To the continuing problems of the mechanism of photosynthesis, the nature of life, and structure of amino acids important to living things, there probably will be no definite conclusions, but research will continue.

As in the case of the nature and treatment of cancer, heart disease, and other great, unconquered diseases, there may be "break-through" but this may be too much to expect. There is hope that there will be further steps toward the early detection and diagnosis of cancer.

With the mass use of the Salk vaccine for polio, the coming year will bring continued and more extensive use of this measure with further evidence of its safety and effectiveness. There should also be progress toward the use of similar vaccines in other virus diseases.

Tuberculosis is being fought chemically through the use of isoniazid and such progress will continue in the coming months.

The spread of the disease, infectious hepatitis, through the serum plasma of blood transfusions, will be prevented by methods of processing pooled bloods to be developed in the coming year.

The immense drain of mental illness upon our civilization will be lessened through the continued application of tranquilizing drugs to mental patients. You can expect the promising developments of the past few years to continue. The most promising of

these drugs are chlorpromazine and reserpine, but it may well be that we shall see further drugs developed in the coming year which will be useful in treatment, not as panaceas, but in making the patient more comfortable and accessible to psychotherapy.

Personality development research will be undertaken with greater intensity because of the prospect that it will give aid in handling the troublesome problems of juvenile delinquency.

The exploration of the past, particularly the early history of the human race, holds fascination for scientists and laymen alike. The bones of the earliest Americans, whose ancestors are believed to have come over from Asia, may in the near future be unearthed in Arctic America. In Africa the focus is upon the remains of early man and his ape-man ancestors, and there is hope that in the not too distant future they can be dated.

Impressive progress will be made toward the supplying of scientists, engineers and technologists for the future through about a hundred science fairs throughout the country in which some 70,000 high school youth will participate, with the National Science Fair as a culmination.

## Postmortem on 1955 Forecast

The science forecast for 1955 issued a year ago shows a good degree of fulfillment.

There were more atomic test explosions by both the United States and Soviet Russia and there was rising fear of the consequences of the increasing numbers of tests, as predicted.

There was an atoms-for-peace meeting, held outside the United States, and it was chiefly important because atomic rivals talked to each other for the first time.

America's first atomic submarine did make a record sea voyage.

There was progress in understanding the evolution of the stars and the structure of the universe. The expanding universe did take on new dimensions due to a revision of astronomical constants.

A giant electronic computer did go to work making numerical forecasts of the weather.

A vaccine for measles, made by the same methods as the polio vaccine, did not come to the testing stage as was expected.

While research continued on photosynthesis, as was expected, discovery of the mechanism of capturing sun's energy was not achieved.

Science News Letter, January 7, 1956

## Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

**THE BIOCHEMISTRY OF VITAMIN B<sub>12</sub>:** A Symposium Held at the London School of Hygiene and Tropical Medicine on 19 February 1955—R. T. Williams, Ed.—Cambridge University Press, Biochemical Society Symposia No. 13, 123 p., \$3.75.

**CAT GENETICS**—A. C. Jude—All-Pets, 126 p., illus., \$4.50. A non-technical discussion for the cat owner.

**A CENTURY OF PROGRESS IN THE NATURAL SCIENCES 1853-1953**—Edward L. Kessel, Ed.—California Academy of Sciences, 807 p., illus., paper, \$10.00. A collection of essays reviewing the accomplishments of the past hundred years.

**INDUSTRIAL SOCIETY: The Emergence of the Human Problems of Automation**—Georges Friedmann, introduction by Harold L. Shepard, Ed.—Free Press, 436 p., \$6.00. To help scientists to climb out of the grooves of their particular specialties.

**MASS TRANSFER OPERATIONS**—Robert E. Treybal—McGraw-Hill, 666 p., illus., \$9.50. The physical operations described here have come to be the responsibility solely of the chemical engineer. For graduate students.

**MINERAL RESOURCES NAVAJO-HOPI RESERVATIONS, ARIZONA-UTAH: Volume III, Construction Materials—Geology, Evaluation, and Uses**—George A. Kiersch and others—University of Arizona Press, 81 p., illus., paper, free upon request to U. S. Bureau of Indian Affairs, Window Rock, Ariz. The Navajo country is the site of many natural construction materials.

**PINYON RESOURCES: Distribution of Pinyon (pinus edulis) Yield and Resin Potentials**, Navajo-Hopi Reservations, Arizona-Utah—Chester R. Deaver and Horace S. Haskell—University of Arizona Press, 37 p., illus., paper, free upon request direct to U. S. Bureau of In-

dian Affairs, Window Rock, Ariz. Report of a study made under contract with the Bureau of Indian Affairs.

**USE AND CONSERVATION OF WATER RESOURCES IN EASTERN STATES**—Richard D. Hoak—Mellon Institute, 8 p., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. The humid eastern states which have long enjoyed an abundant water supply are now beginning to feel the pinch of water shortage.

**WHAT I HAVE LEARNED BY LIVING**—Henry J. Burt—Bruce Humphries, 147 p., \$3.00. Results of fifty years, not only of a scientist's living, but of his pondering and teaching.

Science News Letter, January 7, 1956

### PLANT PATHOLOGY

## New Plant Disease Discovered in U. S.

► A NEW agricultural fungus disease, previously unknown in the United States, has been discovered in Mississippi, scientists with the U. S. Department of Agriculture and Mississippi Agricultural Experiment Station report.

The disease, a downy-mildew of crimson clover, is caused by a fungus, *Peronospora viciae*, which does considerable damage to crimson clover in sections of Europe. The disease has not yet become damaging in the United States.

Leaves of infected crimson clover appear yellowish gray to purple from above and are often curled.

Science News Letter, January 7, 1956

## The Right Way to Play CHESS

**A Chess Manual for All, from Beginner to Club Player**, by Chess Pundit D. BRINE PRITCHARD, with Introduction and Annotations by International Chess Master IMRE KONIG.

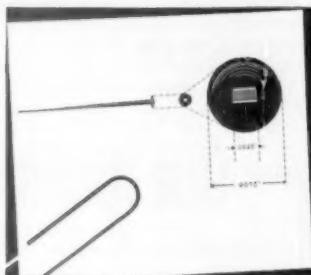
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Draw up the pattern nice and big with India ink. Photograph it down to a stencil of desired size with a good lens (like a *Kodak Process Ektar Lens*) on a virtually grainless, all-or-none material (like *Kodalith Ortho Film*, or for really tiny work, a *Kodak High Resolution Plate*).

Saw out a blank of the semi-conductor crystal. Lap and polish it, finishing up with  $0.5\mu$  grid-size diamond paste. Etch off the remaining few microns of work-strained layer. Wash in trichloroethylene, rinse in distilled water, and dry.

Avoiding daylight or ultraviolet, filter a little *Kodak Photo Resist*. With it, coat the polished semi-conductor surface thinly. Dry under a heat lamp. Hold the stencil tight against the semi-conductor by vacuum. Expose to an arc lamp. Immerse in *Kodak Photo Resist Developer*. Take out. Put on a few drops of *Kodak Photo Resist Dye* to make the developed image visible. Hold under a stream of tepid distilled water to wash away the resist where the dark portions of the stencil shielded it. Pull up the window shades. Blot off the surface moisture. Inspect the pattern with a microscope. If OK, bake for a few minutes to harden the resist. Let an

etchant suitable to the specific semi-conductor remove it to any required depth in those areas where there is no resist left to resist.

Over the whole, deposit a metal electrically, chemically, or by evaporation. Immerse in *2-Ethoxyethyl Acetate*\* for 10 minutes and gently swab. This solvent, undeterred by the overlying metal film, removes the remaining resist.

There's your little triumph in applied solid state physics, complete with electrodes.

*This is basically Bell Telephone Laboratories' idea, not ours. All we did was to suggest Kodak Photo Resist. Apparently it was a good suggestion. Anybody else who wants any suggestions about the Kodak products involved can write Eastman Kodak Company, Graphic Reproduction Division, Rochester 4, N. Y.*

## Enlarging the breakthrough

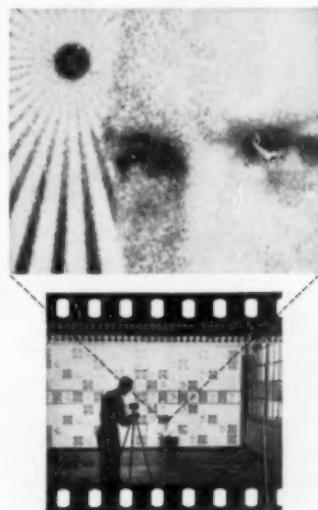
Looked back at now, the film emulsion-making practices of, say 1953, seem unsophisticated. We shall have to let the remark stand at that. The fact is that there has been an abrupt rise in a quasi-quantitative quantity, the product of film speed and sharpness.

About measuring speed there is a lot to be said, but we won't say it here, except that the *Kodak Tri-X Film* which we introduced a year or so ago has significantly expanded the scope of photography.

Sharpness, a subjective impression, has now likewise had a metric imposed on it. There is a mathematical statement—termed acutance—of the density variation across the photographic image of a knife edge. It is quite different from resolving power, a quantity related to the smallest repetitive detail distinguishably reproducible, whether the detail looks sharp or not.

Riding the new speed vs. sharpness curve, we here announce reac-

tivation of the name *Kodak Panatomic-X Film* to apply now to our sharpest roll film, 35mm and other sizes, for general photography. Its Exposure Indexes are 25 for daylight and 20 for tungsten. Its emulsion is less than half as thick as usual in negative film. This shortening of the path along which light can scatter on its way down is part of the reason for the greater sharpness, but only part. The thinness also speeds processing. As for resolving power, witness the following demonstration, as filtered through the press that printed this page:



*Kodak Panatomic-X* is an extreme, as is *Kodak Tri-X*. For those who have been getting along just fine with the speed of *Kodak Super-XX*, but want the sharpness benefit of the 1954 breakthrough, we recommend a new 35mm and 70mm film we are calling by the old name *Kodak Plus-X*. The noble old name *Super-XX* is being retired, except for sheet and aerial film.

*Already both of these new films are among the most widely distributed manufactured products in the United States.*

Price quoted is subject to change without notice.

**This is one of a series of reports on the many products and services with which the Eastman Kodak Company and its divisions are... serving laboratories everywhere**

\*Available as Eastman Organic Chemical No. P2378 at \$2.05 for 1 kg. from our division, Distillation Products Industries, Rochester 3, N. Y.

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CONSERVATION

# NATURE RAMBLINGS

by Horace Loftin



### Moses and the Mother Bird

► HERE is advice from a very wise man: "If you should happen to come upon a bird's nest in any tree, or on the ground, with young ones or eggs, and the mother sitting on the young or the eggs, you must not take the mother with the young. You must rather let the mother go, and only take the young, that you may prosper, and live long."

This simple statement seems to put in a single clear rule all of the many individual techniques for the conservation of our irreplaceable natural resources—from song birds to primeval forests. It says in short, when you use anything from nature, be sure that enough is left to replenish naturally what you take away.

And who was the great naturalist that left us this advice? Why, gray-bearded Moses, the law-giver of the children of Israel (Deuteronomy, Chapter 22, verse 6).

Conservation of natural resources must have been a very real concern of those desert wanderers. Keeping the waters of scattered oases clear and unpolluted was a matter of life and death. Overgrazing of the land by their flocks might mean starvation later. Thoughtless destruction of wildlife and forests resulted in future want.

Did the Israelites follow this admonition of stern old Moses? No; for the lands that once were famous for their greenness have long been turned into bare, eroded desert. Trees were cut and not replaced. Sheep and goats nibbled away the blanket of grass that anchored the topsoil. The Promised Land became a bleak land.

So, as another Biblical figure said, there is nothing new under the sun. The rules of good conservation practices were the same at the dawn of history as they are today, and wise men recognize the same "commandments" that must be observed to safeguard natural resources.

As in Israel, to insure tomorrow's plenty in the United States and the rest of the world, "you must not take the mother with the young."

Science News Letter, January 7, 1956

### PSYCHOLOGY

## Sucking Is Just Reflex, Not Freudian Drive

► EVIDENCE that sucking is a simple reflex and not an inner drive as is claimed by psychoanalytic theory, was reported to the American Association for the Advancement of Science meeting by Dr. W. T. James of the University of Georgia.

Experience with baby puppies shows that when they are with the mother, the young pups suck. They suckle when their little stomachs are crammed full as well as when

they are empty. They suck if they have just been sucking on a bottle and if they have been taking food from a dropper.

And they continue to suck until they fall asleep if the mother stays with them. They begin again immediately when they awake, provided the mother is present.

"Sucking is just one of the many reflex systems of the body which plays a part in life," concludes Dr. James.

Science News Letter, January 7, 1956

# Questions

GEOPHYSICS—How will whistlers be studied? p. 3.

□ □ □

MEDICINE—For what scientific reason were hens taught to smoke cigarettes? p. 5.

How is it possible to save the life of a person who is "dead drunk"? p. 5.

What are ammoniated cigarettes? p. 4.

□ □ □

PSYCHOLOGY—How young can a baby monkey learn to monkey with things? p. 6.

□ □ □

Photographs: Cover, Mount Wilson and Palomar; p. 3, Bell Aircraft Corp.; p. 6 and p. 7, Northrop Aircraft; p. 16, McGraw Electric Co.

## Do You Know?

Puerto Rico sweet potatoes have been successfully introduced in Thailand.

Pantothenic acid is a member of the *vitamin-B* complex and has been found necessary for growth in rats, chicks and microorganisms.

Aircraft production in Great Britain has more than doubled during the last five years.

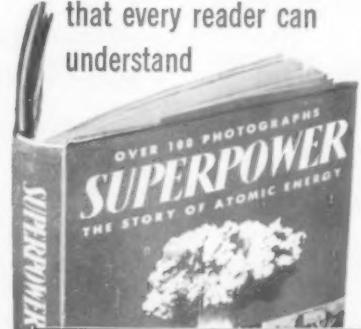
Next year's grasshopper threat is expected to be more than three times that of 1955 on western rangelands.

Some 200 commercial varieties of cheese are made in France, the most important, in order, being Camembert, Gruyere, Port Salut and Roquefort.

Of all the known *rodents*, included in more than 550 described genera, only the house mouse and the house rat are worldwide in distribution.

The vitamin, *folic acid*, has been used in the treatment of tropical sprue and forms of nutritional anemia associated with pregnancy, pellagra and the administration of sulfa drugs.

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## PSYCHOLOGY

**Eye Can "See" Current as Vague Cloud**

► EACH of your sense organs is especially sensitive to a particular kind of stimulation. The eye is especially sensitive to light and distinguishes between various intensities of light, patterns, colors, and so on.

But each sense organ is also sensitive to the passage through it of a weak electric current. Your eye "sees" an electric current as vague bright clouds that hover over much of the field of vision, Dr. Lorin A. Riggs of Brown University, Providence, R. I., told the American Association for the Advancement of Science in Atlanta. The clouds are known to scientists as phosphenes.

On the basis of previous experiments by other investigators, it might be expected that seeing a red, a green, or a blue light would have a distinctive effect on the bright clouds aroused by electric current.

If this were true, the mild electric current applied to the eye would serve as a useful tool to measure color vision, a very difficult thing to measure precisely.

Unfortunately, Dr. Riggs found that it does not work. The phosphenes are affected, not by colors seen previously, but by the visual system for seeing at night or in very dim illumination. All the various colors have similar effects on the phosphenes produced by electric current.

Stimulation of the eye with electric current does, however, provide scientists with another new research tool. It will be of use, chiefly, in studying dark adaptation and the responses of the eye to very dim light.

Science News Letter, January 7, 1956

## VITAL STATISTICS

**Predict Three Score Years And 20 for Many in U.S.**

► MANY AMERICANS will by the year 1970 be beating the Biblical length of life of three score years and ten. They will be living to three score years and 20.

The proportion living to 100 years is about the same today as it was a century ago or a millennium ago, however.

These are the predictions of Dr. Louis J. Dublin of the Institute of Life Insurance, who gave two Messenger Lectures at Cornell University, Ithaca, N. Y.

In 1970, Dr. Dublin said, the average American white man of 65 will have an even chance of reaching 79. The white woman of 65 will have a life expectancy of 83 years.

Dr. Dublin sees little basis for "extravagant forecasts of longevity based on a dietary revolution or some world-shaking discovery in connection with the chronic diseases."

Most deaths, he pointed out, are due to the aging process of the body and there is no sign that this will be reversed.

Science News Letter, January 7, 1956

## GENERAL SCIENCE

**Science 1921-1955**

► A THIRD of a century ago SCIENCE SERVICE, in its first year of operation, covered for newspapers the 1921 meeting of the American Association for the Advancement of Science meeting at Toronto, Canada. The late Dr. Edwin E. Slosson, first SCIENCE SERVICE director, and Watson Davis, now SCIENCE SERVICE director, reported the Toronto meeting by wire.

At the 1955 meeting at Atlanta, Mr. Davis contrasted those early days of science reporting with dispatches he has sent out from the latest sessions.

There has not been time enough to verify one prediction made at the 1921 meeting. The late Dr. Eliot Blackwelder of Harvard forecast that some millions of years in the future an entirely new and more highly organized animal may spring from some ancestral stock now relatively obscure. It would rise, at first slowly and then more rapidly, and "would finally achieve even greater heights of achievement than anything which lies within the capacity of the human species."

The corn borer, which since has spread to most of America's corn areas, was then

only menacing New York state after doing damage to Canadian areas.

The strawberry weevil, tiring of a fare of strawberry, blackberry and raspberry buds, was found to be attacking apple, tomato and cotton.

Spores of wheat rust disease were found to travel as high in the air as 10,000 feet.

The first aerial battle in man's war on the insects was reported. One U. S. Air Service airplane laden with poison dust killed thousands of caterpillars in the tops of Catalpa trees in Ohio. Before this, airplanes had been used only for scouting insect infestations, not for actually fighting them.

Longest-tongued and heaviest bees were found to bring home the most honey.

Presidents of the AAAS for the 25 years preceding 1921 were found to average 61 years five months in age. (The 1955 retiring president is aged 61 years five months.)

A world's record for turtle speed was announced as a mile in three years, 11 months and 19 days.

Science News Letter, January 7, 1956

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• ELECTRONICS KIT simplifies the teaching of electron tube theory, radio transmitting and receiving and basic radar and television. Containing 108 component parts, a 400-page work book and 73 related experiments, the kit is a do-it-yourself teacher.

Science News Letter, January 7, 1956

• URANIUM KIT for both the amateur and professional prospector can be used to locate the radioactive mineral without a Geiger or scintillation counter. The kit contains sample ores, testing devices and instructions.

Science News Letter, January 7, 1956

• TUBULAR DEADLOCK for homes, stores and buildings is equipped with double cylinders for added lock security. Key operation is necessary both inside and outside the door. Designed for new and existing key systems, the lock has brass cylinders with five or six pin-tumbler mechanisms.

Science News Letter, January 7, 1956

• NYLON LUNG, described as the smallest and most advanced portable respirator of its kind, is a British product. Operated on either main power sources or batteries, the 80-pound device allows patients to move freely in bed. It can also be dropped into the sea for emergency use aboard ships.

Science News Letter, January 7, 1956

• SLIDE PROJECTOR has a built-in automatic photographic slide changer. The 30-watt, motor-fan-cooled projector is equipped with a fast 5" Luxtar F/3.5 lens. The trays take 30 slides in any type mount.

Science News Letter, January 7, 1956



• WAFFLE MAKER, shown in the photograph, insures uniform baking heat at all

times. The grid itself is actually the unit's thermostat and when the waffle-maker becomes hotter or cooler the grid automatically adjusts heat. The chromium plated waffle baker turns off when waffles are done.

Science News Letter, January 7, 1956

• TRAFFIC GAME for children makes fun out of practicing safe driving techniques and observing traffic laws. A simulated steering control turns a life-like steering wheel along a 36-inch moving highway. It has a dashboard and horn too.

Science News Letter, January 7, 1956

• FOG HORN for use on small boats blows its own warning using refrigerant gas. Independent of electrical or mechanical power, the liquefied gas under pressure is routed through a whistle when the alarm is needed. The trigger-operated fog-horn weighs just under four pounds and emits a continuous 12-minute blast audible for at least one mile.

Science News Letter, January 7, 1956

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